

WHAT IS CLAIMED IS:

1. A method for preparing a double glazing unit, which comprises supporting two glass sheets so as to maintain a certain gap therebetween, and injecting a resin material from a die to form a resin spacer in a peripheral edge between the two glass sheets while relatively moving the two glass sheets and the die so as to move the die along the peripheral edge between the two glass sheets, the die injecting the resin material in a certain sectional shape;

the method comprising:

providing the die between a first stage and a second

stage, the first stage having the two glass sheets put thereon first before forming the resin spacer, the second stage having the two glass sheets transferred thereon next;

providing the first stage with a first guide for guiding the two glass sheets in a horizontal direction parallel to a glass sheet surface, providing the second stage with a second guide for guiding the two glass sheets in the horizontal direction parallel to the glass sheet surface and, putting lower edge surfaces of the glass sheets on the first stage on the first guide, and putting the lower edge surfaces of the glass sheets on the second stage on the second guide;

providing the first stage with a first holder in

touch with faces of the two glass sheets that do not

one holder  
does not  
touch both  
faces.

confront each other, providing the second stage with a second holder in touch with the faces of the two glass sheets that do not confront each other, and maintaining the certain gap before and/or during forming the resin

5 spacer by supporting the two glass sheets on the first  
stage in substantially vertical fashion by the first  
holder and supporting the two glass sheets on the second  
stage in substantially vertical fashion by the second  
holder;

10 carrying out horizontal movement of the relative  
movement by moving the two glass sheets in the horizontal  
direction parallel to the glass sheet surface between the  
first stage and the second stage; and

carrying out vertical movement of the relative  
movement by moving the die in a vertical direction.

2. The method for preparing a double glazing unit according to Claim 1, wherein the relative movement comprises movement (A) for reciprocating the two glass sheets in the horizontal direction parallel to the glass sheet surface between the first stage and the second stage, and movement (B) for moving the die in the vertical direction, and the movement (A) and the movement (B) are alternately carried out twice to form the spacer in horizontal edge portions of the peripheral edge between the glass sheets during movement between the first stage and the second stage and to move the die so as to form the spacer in vertical edge portions of the

peripheral edge between the glass sheets during halts of the two glass sheets on the first stage or the second stage, thereby forming the spacer throughout the peripheral edge of the two glass sheets.

- 5 3. The method for preparing a double glazing unit according to Claim 2, wherein the relative movement and the forming of the spacer are carried out in the following order:

positioning a vertical edge portion between the two  
10 glass sheets close to the second stage along a vertical line of the die by the movement (A);

halting the horizontal movement of the two glass sheets;

forming the spacer in the vertical edge portion  
15 close to the second stage by the movement (B);

halting the movement of the die in the vertical direction;

forming the spacer in a horizontal edge portion between the two glass sheets by the movement (A);

20 positioning a vertical edge portion between the two glass sheets close to the first stage along the vertical line of the die;

halting the horizontal movement of the two glass sheets;

25 forming the spacer in the vertical edge portion close to the first stage by the movement (B);

halting the movement of the die in the vertical

direction; and

forming the spacer in a horizontal edge portion between the two glass sheets by the movement (A).

4. The method for preparing a double glazing unit according to Claim 1, wherein the second holder includes a suction type pushing and pulling device on the second stage, the suction type pushing and pulling device sucking and holding the faces of the glass sheets that do not confront each other; and the suction type pushing and pulling device moves in the horizontal direction parallel to the glass sheet surface to move the two glass sheets in the horizontal direction parallel to the glass sheet surface between the first stage and the second stage.

5. The method for preparing a double glazing unit according to Claim 4, wherein the suction type pushing and pulling device sucks and holds portions of the lower edges of the two glass sheets close to the second stage, and the suction type pushing and pulling device reciprocates in a region of the second stage to move the two glass sheets in the horizontal direction parallel to the glass sheet surface.

6. A method for preparing a double glazing unit, which comprises supporting two glass sheets so as to maintain a certain gap therebetween, and injecting a resin material from a die to form a resin spacer in a peripheral edge between the two glass sheets while relatively moving the two glass sheets and the die so as to move the die along

the peripheral edge between the two glass sheets, the die injecting the resin material in a certain sectional shape;

the method comprising:

5 providing the die between a first stage and a second stage, the first stage having the two glass sheets put thereon first before forming the resin spacer, the second stage having the two glass sheets transferred thereon next;

10 making up the relative movement by movement (A) for reciprocating the two glass sheets in a horizontal direction parallel to a glass sheet surface between the first stage and the second stage, and movement (B) for moving the die in a vertical direction;

15 supporting lower edge surfaces of the two glass sheets on the first stage and supporting the two glass sheets on the first stage in substantially vertical fashion while maintaining a certain gap between the two glass sheets by sucking at least vertical portions close

20 to the second stage, the vertical portions locating on faces of the two glass sheets that do not confront each other, supporting lower edge surfaces of the two glass sheets on the second stage and supporting the two glass sheets on the second stage in substantially vertical

25 fashion while maintaining the certain gap between the two glass sheets by sucking at least vertical portions close to the first stage, the vertical portions locating on the

TOP SECRET - 30342942

faces of the two glass sheets that do not confront each other, during the movement (A); and

forming the spacer in horizontal edge portions of the peripheral edge between the glass sheets during  
5 movement between the first stage and the second stage by carrying out alternately the movement (A) and the movement (B) twice, and forming the spacer in vertical edge portions of the peripheral edge between the glass sheets to form the spacer throughout the peripheral edge  
10 between the two glass sheets by moving the die during halts of the two glass sheets on the first stage or the second stage.

7. An apparatus for preparing a double glazing unit, which comprises a die for injecting a resin material in a  
15 certain sectional shape, and a moving device for relatively moving the die and two glass sheets so as to move the die along a peripheral edge between the two glass sheets while supporting the two glass sheets so as to maintain a certain gap therebetween, and wherein a  
20 resin spacer is formed in the peripheral edge between the two glass sheets by carrying out the relative movement and injecting the resin material from the die;

the apparatus comprising a first stage and a second stage, the first stage having the two glass sheets put  
25 thereon first before forming the resin spacer, the second stage having the two glass sheets transferred thereon next, the die movably provided between the first stage

SEARCHED  
INDEXED  
SERIALIZED  
FILED

and the second stage in a vertical direction;

the moving device including a first guide provided on the first stage for supporting lower edge surfaces of the glass sheets and guiding the glass sheets in a horizontal direction parallel to a glass sheet surface, and a second guide provided on the second stage for supporting the lower edge surfaces of the glass sheets and guiding the glass sheets in the horizontal direction parallel to the glass sheet surface and, a first holder provided on the first stage and in touch with faces of the two glass sheets that do not confront each other, and a second holder provided on the second stage and in touch with the faces of the two glass sheets that do not confront each other;

wherein the two glass sheets are moved in the horizontal direction parallel to the glass sheet surface between the first stage and the second stage to carry out horizontal movement of the relative movement while maintaining the certain gap before and/or during forming the resin spacer by supporting the two glass sheets on the first stage in substantially vertical fashion by the first holder and supporting the two glass sheets on the second stage in substantially vertical fashion by the second holder; and

wherein the die is moved in the vertical direction to carry out vertical movement of the relative movement.

8. The apparatus for preparing a double glazing unit

according to Claim 7, wherein the relative movement comprises movement (A) for reciprocating the two glass sheets in the horizontal direction parallel to the glass sheet surface between the first stage and the second 5 stage, and movement (B) for moving the die in the vertical direction, and the movement (A) and the movement (B) is alternately carried out twice to form the spacer throughout the peripheral edge between the glass sheets, the holder maintains the certain gap between the two 10 glass sheets on the first stage, the spacer is formed in horizontal edge portions of the peripheral edge between the glass sheets during movement between the first stage and the second stage, and the die is moved to form the spacer in vertical edge portions of the peripheral edge 15 between the glass sheets during halts of the two glass sheets on the first stage or the second stage.

9. The apparatus for preparing a double glazing unit according to Claim 7, wherein the second holder includes a suction type pushing and pulling device for pushing and 20 pulling the two glass sheets between the first stage and the second stage, the suction type pushing and pulling device comprises a liner guide provided in parallel to a moving direction of the glass sheets under the second guide, a sucking frame movable along the liner guide, and 25 confronted suction chucks provided so as to suck the faces of the two glass sheets that do not confront each other.

10. The apparatus for preparing a double glazing unit according to Claim 9, wherein the suction chucks suck and hold portions of lower edges of the two glass sheets close to the second stage, and the suction type pushing and pulling device is reciprocative in a region of the second stage.
11. The apparatus for preparing a double glazing unit according to Claim 7, wherein a pair of suckers are provided on the second stage in the vicinity of the die 10 to extend in the vertical direction so as to suck the faces opposite to the confronted faces of the two glass sheets.
12. The apparatus for preparing a double glazing unit according to Claim 7, wherein a pair of suckers are 15 provided on the first stage in the vicinity of the die to extend in the vertical direction so as to suck the faces opposite to the confronted faces of the two glass sheets.